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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,680	11/20/2003	Lewis R. Norman	2003-IP-009800U1	8569

7590

12/08/2005

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EXAMINER
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WHITE, EVERETT NMN

ART UNIT	PAPER NUMBER
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1623

DATE MAILED: 12/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/717,680

Applicant(s)

NORMAN ET AL.

Examiner

Everett White

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 8-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Election Without traverse*

1. Applicant's election without traverse of Group I, Claims 1-7 and 32 in the reply filed on September 27, 2005 is acknowledged.
2. Claims 1-7 and 32 are pending.
3. Claims 8-31 are withdrawn from consideration for being directed to a Non-elected invention.

### *Claim Rejections - 35 USC § 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-4, 6, 7 and 32 rejected under 35 U.S.C. 102(b) as being anticipated by Phillips et al (US Patent No. 5,002,125).

Applicants claim a method of crosslinking a polysaccharide comprising the steps of: (a) providing a metal coordinating group having a reactive site, (b) derivatizing a polysaccharide with the metal coordinating group to produce a derivatized polysaccharide having bidentate ligands, and (c) crosslinking the derivatized polysaccharide having bidentate ligands with a metal ion to form a metal ligand coordination complex. Additional limitations in the dependent claims include the method wherein the polysaccharide comprises guar, xanthan, locust bean gum, hydroxy ethyl and hydroxy propyl derivatives of gums, or hydroxyethylcellulose; the method wherein the derivatized polysaccharide having bidentate ligands is crosslinked with a crosslinking agent comprising a compound chosen from the group consisting of copper, nickel, iron, ruthenium, palladium, platinum, iridium and cobalt; the method wherein the bidentate ligands comprise ethylenediamine, acetylacetonate ions, dithiocarbamate, 2,2'-bipyridine, 1,10-

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phenanthroline, or 8-hydroxyquinolino; the method wherein step (c) occurs within a wellbore in a subterranean formation; the method wherein the polysaccharide comprises guar and the crosslinking agent is a derivative of iron or ruthenium. The metal ion crosslinked polysaccharide product produced by the method is also claimed.

The Phillips et al patent discloses polymers useful in the formation of stable fracturing fluid, which include polysaccharides and polysaccharide derivatives, wherein guar, hydroxypropyl guar, hydroxyethyl guar, cellulose and its derivatives, and xanthan are set forth as examples (see column 9, last paragraph and column 10, lines 1 and 2). The Phillips et al patent discloses cross-linking agents in combination with solutions of polymeric thickening agents, which include multivalent metal ions, wherein iron is listed as an example of a multivalent metal ion that may be used in the combination. Phillips et al discloses that the combination of cross-linking agents and polymers include admixing guar and its derivatives as a polymer with a cross-linking agent, wherein compounds suitable for use as crosslinking agents include acetylacetonate ions -in the form of titanium acetylacetonate (see column 10, 2<sup>nd</sup> full paragraph). The Phillips et al patent discloses that titanium acetylacetonate is an effective agent for hydroxypropyl guar or carboxymethyl hydroxypropyl cellulose (see column 10, lines 28-30). The guar, hydroxypropyl guar and hydroxyethyl guar of the Phillips et al patent anticipate the guar, hydroxy ethyl and hydroxyl propyl derivatives of gums in instant Claim 2, the iron set forth in the Phillips et al patent anticipates the iron disclosed in instant Claims 3 and 7, and the titanium acetylacetonate disclosed in the Phillips et al patent anticipates the acetylacetonate ions disclosed in instant Claim 4. Also, see column 3, lines 61-64 of the Phillips et al patent wherein it is disclosed that the fracturing fluid thereof is introduced into a well and displaced from the wellhead down the well to the vicinity of the subterranean formation, which anticipate the subject matter of instant Claim 6. The crosslinking of a polysaccharide described in the Phillips et al patent anticipates the instantly claimed method of crosslinking a polysaccharide and the claimed product thereof.

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6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Phillips et al (US Patent No. 5,002,125).

Applicants claim a method of crosslinking a polysaccharide wherein the crosslinking agent is present in an amount up to about 500 moles of crosslinking agent per mole of polysaccharide.

The Phillips et al patent discloses polymers useful in the formation of stable fracturing fluid, which include polysaccharides and polysaccharide derivatives, wherein guar, hydroxypropyl guar, hydroxyethyl guar, cellulose and its derivatives, and xanthan are set forth as examples (see column 9, last paragraph and column 10, lines 1 and 2).

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The Phillips et al patent discloses cross-linking agents in combination with solutions of polymeric thickening agents, which include multivalent metal ions, wherein iron is listed as an example of a multivalent metal ion that may be used in the combination. Phillips et al discloses that the combination of cross-linking agents and polymers include admixing guar and its derivatives as a polymer with a cross-linking agent, wherein compounds suitable for use as crosslinking agents include acetylacetonate ions -in the form of titanium acetylacetonate (see column 10, 2<sup>nd</sup> full paragraph). The Phillips et al patent discloses that titanium acetylacetonate is an effective agent for hydroxypropyl guar or carboxymethyl hydroxypropyl cellulose (see column 10, lines 28-30).

The instant method of crosslinking a polysaccharide differs from the polysaccharide crosslinking of the Phillips et al patent by claiming that the crosslinking agent is present in an amount up to about 500 moles of crosslinking agent per mole of polysaccharide. The number of moles of crosslinking agent per mole of polysaccharide is not disclosed in the Phillips et al patent. However, Phillips et al does suggests using an amount of crosslinking agent that falls within the instantly claimed range by disclosing in column 5, lines 36-45 that cross-linking agents are used to increase the viscosity of the initially formed aqueous solution from a first elevated value after the polymeric thickening agent has reached an initial state of hydration in the fracturing fluid to yet a higher stabilizing value. Phillips et al discloses that during displacement of the fracturing fluid down the well, the viscosity of the fracturing fluid is increased by a factor of at least 2 to a value sufficient to stabilize the energizing phase in the aqueous fracturing fluid phase. Note that the recitation "in an amount up to about 500 moles of crosslinking agent per mole of polysaccharide" is absent of a specific lower limit. The range of the ratio could be interpreted as 0 to 500 moles of crosslinking agent per mole of polysaccharide.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time of Applicants invention having the Phillips et al patent before him to use a sufficient amount of crosslinking agent to obtained a higher stabilizing value of the fracturing fluid in view of the closely related structures (polysaccharide and crosslinking agents) used

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to carry out the process thereof and the resulting expectation of similar polymeric thickening properties.

**Summary**

8. Claims 1-7 and 32 are rejected; Claims 8-31 are withdrawn from consideration.

**Examiner's Telephone Number, Fax Number, and Other Information**

9. For 24 hour access to patent application information 7 days per week, or for filing applications, please visit our website at [www.uspto.gov](http://www.uspto.gov) and click on the button "Patent Electronic Business Center" for more information.

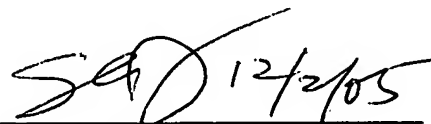
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Everett White whose telephone number is (571) 272-0660. The examiner can normally be reached on Monday-Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shaojia A. Jiang, can be reached on (571) 272-0627. The fax phone number for this Group is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-1600.



E. White



Shaojia A. Jiang  
Supervisory Primary Examiner  
Technology Center 1600